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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/856,468	06/07/2001	Takaaki Hirai	107176-00006	6366

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EXAMINER

CHANG, VICTOR S

ART UNIT

PAPER NUMBER

1771

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Please find below and/or attached an Office communication concerning this application or proceeding.

mk-9

<b>Office Action Summary</b>	<b>Application No.</b> 09/856,468	<b>Applicant(s)</b> HIRAI ET AL.	
	<b>Examiner</b> Victor S Chang	<b>Art Unit</b> 1771	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All   b) ☐ Some \*   c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.  
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). ____.  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                               | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>3, 7, 8</u> . | 6) <input type="checkbox"/> Other: .  |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 6, 7, 12-14 and 16-19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 6 and 16, the phrases "melt tension" are vague and indefinite. It appears that Applicants is attempting to disclose the "melt index" or "melt flow rate" of the polyester resin in melt state (Specification, page ~~5~~44). Further, the associated melt temperature is not in the claim; and the unit in "g" is also vague, indefinite and confusing, i.e., it lacks the length of time.

In claim 12, the structure of the molded foam article is vague and indefinite, i.e., the structural position, i.e., "on", of the film or sheet is unclear.

Similarly, in claim 14, the structural position of the film or sheet is unclear.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 08-174590 (English Abstract and computer translation) either taken individually, or in view of Park (US 5475037).

JP '590 is directed to preparing pre-expanded particles of a thermoplastic polyester resin and bonding (i.e., molding) ~~to~~ pre-expanded foam particles to form a molded foam with a bulk density of 0.02-0.7 g/cm<sup>3</sup>. The pre-expanded particles are prepared by melting the thermoplastic polyester resin containing a foaming agent by means of an extruder to effect extrusion foaming, following which the extruded foam material is cut, in which the crystallinity of 25% or less is maintained (Abstract).

For claims 1 and 2, JP '059 lacks express teachings of the bulk density of the prepuff (pre-expanded foam particle), the crystallization peak temperature and the composition of the polyester resin. However, it is noted that JP '590 does teach that a suitable low crystallinity is essential to the prepuff as set forth above, and it is well known that the crystallinity of PET can be modified by copolymerizing terephthalic acid with cyclohexanedimethanol and/or isophthalic acid. Alternatively, Park's invention is directed to a low density foam formed from an amorphous polyethylene terephthalate copolymer, in one embodiment the low density foam is formed by molding expanded foam particles (Abstract and Example 5 at column 8). Park teaches that the foamable amorphous copolyester resin can be obtained by copolymerizing isophthalic acid and cyclohexanedimethanol, or mixtures thereof, in an amount of from about 15 % to about 50 % of the total of terephthalic acid, isophthalic acid, and cyclohexanedimethanol (column 12, lines 25-56). (The Examiner notes that the aforementioned ratios are

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believed to be weight ratios, so as to be consistent with the Park's Specification at column 3, line 11.) As such, in the absence of unexpected results, it would have been obvious to one skilled in the art to modify the copolyester resin by copolymerizing terephthalic acid with suitable amount of isophthalic acid and cyclohexanedimethanol co-monomers, as taught by Park, motivated by the desire to obtain a modified copolyester foamed particles having a suitable low crystallinity, as taught by JP '059. As to the bulk foam density of the prepuff in claim 1, the Examiner takes Official Notice that it is conventional to prepare prepuff particles with a low bulk density in the range of 0.01 to 1.0 g/cm<sup>3</sup>, as evidenced by the Example 4 of Park, which shows a pre-puff having a density of 27.55 kg/m<sup>3</sup>, i.e., 0.028 g/cm<sup>3</sup> (column 7, line 66). Lastly, the crystallization peak temperature in claim 1 is believed to be either inherently disclosed, or an obvious optimization by the suitable copolyester composition of the prior art combination.

For claims 3 and 15, the Examiner takes Official Notice that incorporating small amount of polytetrafluoroethylene particulates as a foam nucleating agent is old and well known, as evidenced by the state of the art Allen et al. (US 4683247) which teaches the use of polytetrafluoroethylene particulates as a foam nucleating agent (column 1, lines 51-55).

For claim 4, JP '590 teaches that the extrudate was cut into pre-expanded foam particles as set forth above.

For claim 5, JP '590 teaches that various methods can be used to make moldable prepuff particles ([0007] of computer translation). As such, it would have been

obvious to one of ordinary skill in the art to prepare the moldable prepuff particles in cylindrical shape, which is well known as a conventional shape of pre-expanded moldable polyolefin foam particles, motivated by the desire to obtain prepuff particles which can be used in the conventional thermoplastic foam molding process.

For claims 6 and 16, it is believed that the "melt index" of a suitable copolyester resin is either inherently disclosed, or an obvious optimization to one of ordinary skill in the art.

For claims 7 and 16, it is believed that an open cell ratio in the range of from 5 to 35% is either inherently disclosed, or an obvious optimization to one skilled in the art, as evidenced in Example 2 of Park reference, which shows expanded foams with an open cell content of 7% (column 7, line 3).

For claims 8 and 17, JP '590 teaches that it is a common practice to carry out a post expansion of the pre-expanded particles by pressure treatment ([0013] of computer translation).

For claims 9 and 17, it is believed that the prior art combination teaches that the crystallinity can be modified to the extent of being amorphous by copolymerizing terephthalic acid with suitable amount of isophthalic acid and cyclohexanedimethanol co-monomers, as set forth above.

For claim 10, JP '590 teaches that a polyester foam molding is obtained by filling up a metal mold with pre-expanded foam particles, carry out further heat expansion ([0002] of computer translation).

For claims 11 and 19, JP '590 teaches that the bulk density of a molded foam is 0.02-0.7 g/cm<sup>3</sup>. Although JP '590 is silent about the fusion ratio, it is noted that JP '590 teaches essentially the same foaming and molding processes as the instant claimed invention. As such, it is believed that a suitable range of fusion ratio is also either inherently disclosed, or an obvious optimization to one skilled in the art.

For claims 12 and 13, it is believed that molding a foamed article with a layer of film or sheet as a skin layer is old and well known. Further, in the absence of unexpected results, it would have been obvious to one of ordinary skill in the art to mold the article with a suitable amount peel strength between the foam core and the skin layer, motivated by the desire to obtain a durable molded composite foam article.

With respect to the product-by-process claims 14, 18 and 20, because only nominal conventional steps are involved and the method limitations have not been shown on the record to produce a patentably distinct article, as such the formed articles are rendered *prima facie* obvious. It should be pointed out that product-by-process claims are product claims and that to be limiting in a product claim, a process limitation must be evidenced as effecting the structure or chemistry of the resultant product over the prior art. Further, the burden of proof for this showing is on Applicant after the Examiner presents an otherwise *prima facie* rejection. Note MPEP 2113 for a more detailed description.

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. In addition, the following references are cited of interest for making polyester foams:

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US 6054500 to Ghatta et al.

US 6020421 t Fukushima et al.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Victor S Chang whose telephone number is 703-605-4296. The examiner can normally be reached on 8:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrel H Morris can be reached on 703-308-2414. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

VSC  
March 31, 2003

DANIEL ZIRKER  
PRIMARY EXAMINER  
GROUP 1300

1700

*Daniel Zinker*